

# Programs, Practices, People

## Temple University Studies Aging

A multifaceted research team from Temple University Health Sciences Center has received a Federal grant of nearly \$390,000 to investigate the biochemical causes of aging in certain body functions.

The five-member team, coordinated by Dr. Richard Adelman, assistant professor of biochemistry at Fels Research Institute, received the 1-year grant from the National Institute of Child Health and Human Development.

The team is studying the mechanisms of biological aging by investigating molecular changes in certain age-dependent processes such as enzymes; certain molecules that bind with thyroxine; histones, which

are water soluble proteins; the relationship between the production of the sugar glucose and lipids; and myelination, the formation of a fatty substance which covers some nerves.

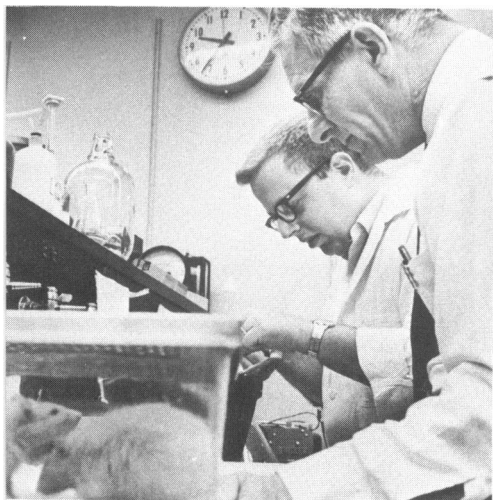
Co-investigators are Dr. Gerald Litwack, professor of biochemistry, Dr. Richard Hanson, associate professor of biochemistry, Dr. W. K. Paik, associate professor of biochemistry, all at Fels, Dr. M. S. Patel, research assistant professor of pediatrics and biochemistry at St. Christopher's Hospital for Children, and Dr. Ronald A. Pieringer, associate professor of biochemistry at Temple University's School of Medicine.

"What causes an organism to age is one of the most complicated problems confronting biological research," Adelman said. "We don't know whether

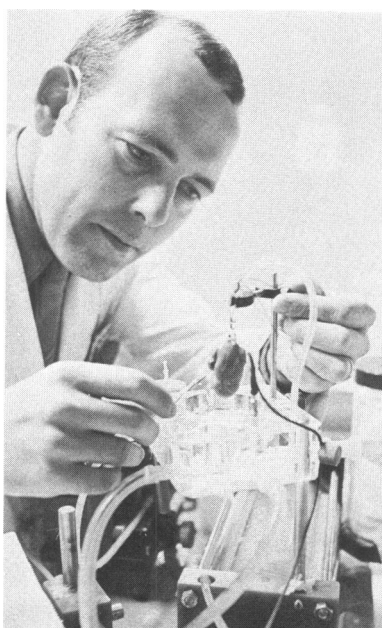
aging is the natural result of differentiation, a culmination of environmental and hereditary factors, or some combination of these. One obstacle has been lack of sufficient knowledge of molecular alterations associated with aging. Our basic premise is that aging is a natural consequence of growth and development. So we are going to investigate the biochemical nature and origin of factors which regulate the chronological development, the adaptive capacity and the deterioration associated with advancing age in a few physiological systems."

He noted that the research could add to the knowledge of children's diseases related to metabolic disorders—the breakdown of lipids involved in such diseases as Tay-Sach's, the

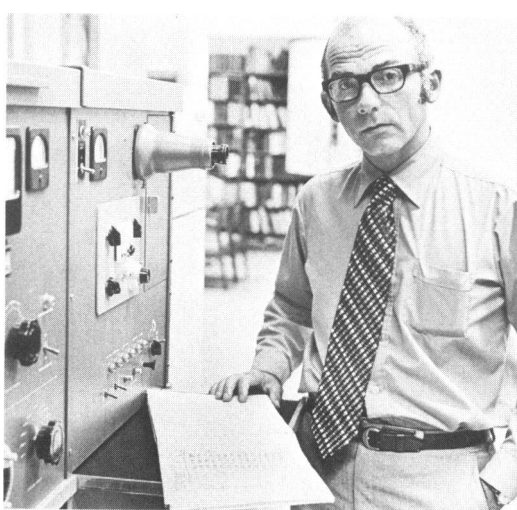
**Dr. Adelman and Dr. Weinhouse**



**Dr. Hanson**

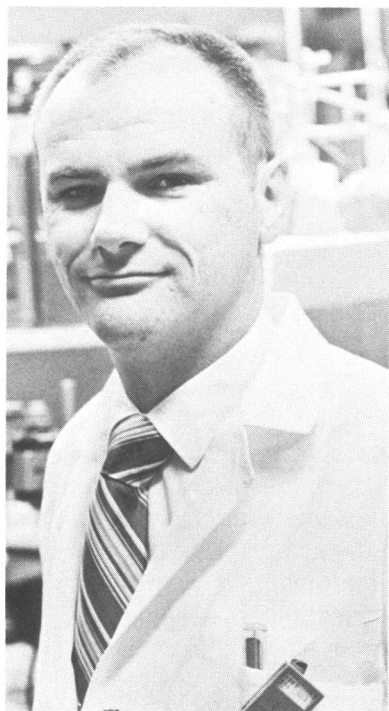


**Dr. Litwack**





**Dr. Paik**



**Dr. Pieringer**

breakdown of myelination in multiple sclerosis, the interference with key enzyme systems, and brain maturation.

The work also could be useful in the fight against cancer, which, like aging, also involves some similar specific physiological changes, Adelman pointed out.

## **Environmental Engineering Intersociety Board Certification Examination**

The next qualifying examination for certification by the Environmental Engineering Intersociety Board will be held on Monday, June 12, 1972. The examination will consist of two parts: (a) the specialty field selected by the applicant and (b) oral.

Areas of specialty recognized by the Board are sanitary engineering, air pollution control engineering, industrial hygiene engineering, and radiation and hazard control engineering.

Application forms may be obtained from the Executive Secretary, Environmental Engineering Intersociety Board, Inc., P.O. Box 9728, Washington, D.C. 20016. For consideration of admission to the examination, applications must be received by March 15, 1972.

The Environmental Engineering Intersociety Board, Inc., has been organized to improve the practice, elevate the standards, and advance the cause of environmental engineering to better serve the public. Each applicant certified becomes a diplomate of the American Academy of Environmental Engineers.

Requirements for certification are good moral and professional character, graduation with a degree in engineering from a qualified institution, registration as a professional engineer in one of the States of the United States or Provinces of Canada, 8 years of professional environmental engineering work, and satisfactory completion of written and oral examinations.

## **Laundry Product Hazards In Nurseries**

Substances which may be hazardous to premature and full-term newborn infants are still being used in the laundering of clothing, diapers, and bedding for hospital nurseries, the American Academy of Pediatrics warned in a recent "Newsletter."

In a statement issued by the AAP's Committee on Drugs, the academy pointed out that premature and full-term newborn infants have contracted methemoglobinemia after their diapers were rinsed with the bacteriostatic agent 3-4-4' trichlorocarbanilide (TCC).

Methemoglobinemia, a condition caused by various poisons, results in a lack of oxygen which may lead to death or serious disturbance of the vital functions.

"Although direct proof of the etiologic role of TCC is lacking, the association is of sufficient concern that the forthcoming academy manual, Standards and Recommendations for Hospital Care of Newborn Infants, Second Edition, makes reference to the hazards of using TCC," the AAP statement emphasized.

The academy also pointed out that although most hospital laundry procedures omit TCC in treating newborn infants' clothing and bed linens, "sporadic instances of neonatal methemoglobinemia associated with exposure to this substance still come to the attention of local, State, and national health agencies, manufacturers, and the AAP Committee on Drugs."

The academy further indi-

cated that deaths and severe illness have been reported in one maternity hospital when sodium salt of pentachlorophenol (PCP) intoxicated babies when it was absorbed through the skin.

The PCP was present in the antimicrobial neutralizer product used in the final rinse of the laundry process for diapers, infant undershirts, and crib linens for the nursery.

Nursery physicians are frequently not apprised of the procedures used in laundering infants' clothing and bedding, and often they are not consulted before a change in the laundry procedure is implemented, the statement pointed out.

The academy statement further raised concern over newer laundering agents such as enzyme-detergent combinations and optical brighteners: Will these cause poisoning epidemics in the newborn nursery? Do these pose hazards as residues in laundered clothing and crib linen for premature and full-term infants?

"The biology of the premature and full-term neonate demands that even the most innocent appearing substance in their environment be scrutinized for the possibility of adverse effects," the statement concluded. "Until data on toxicity are available for various substances which are proposed for introduction into the nursery, clinical judgment would dictate avoiding them."

## **Red Protein Substance Isolated from Liver**

Cytochrome P-450, the elusive red pigment from liver, may prove to be part of the

solution to pollution, drug addiction, alcoholism, and even cancer.

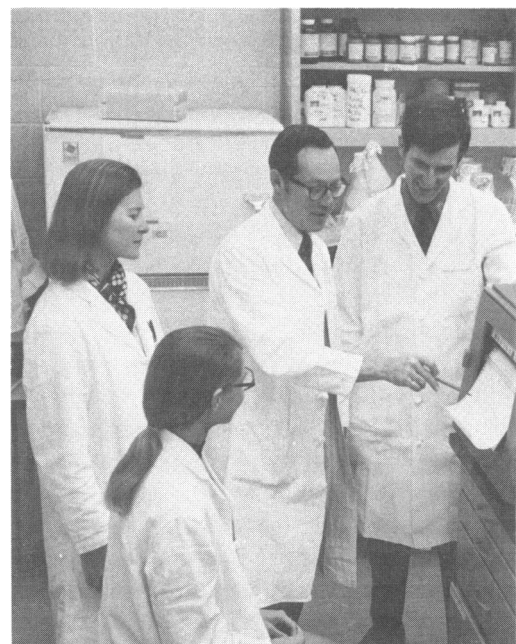
University of Michigan Medical Center biochemists recently obtained the pigment in a soluble, functional form. They may now be able to understand not only how the body metabolizes useful chemicals but also how it is able to detoxify such harmful substances as petroleum products, certain cancer-causing agents, nicotine, alcohol, and drugs, including marijuana.

Dr. Minor J. Coon, professor and chairman of the department of biological chemistry, and his associates, Dr. Anthony Lu, Dr. Henry Strobel, Dr. Anne Autor, and Miss Joanne Heidema, were the first to succeed in separating the protein from liver membranes. The scientists did not discover P-450; the Japanese scientists Omura and Sato first identified it as a cytochrome.

P-450 is a little-known red protein, or pigment, that accelerates the metabolism of hormones, fatty acids, and other chemicals required by the body as well as the detoxification of foreign substances. According to the biochemists, it is "the most versatile biological catalyst known."

Without P-450, according to Coon, people might not even be able to tolerate simple medications, let alone such combinations as barbiturates and alcohol. P-450 is a scientific anomaly because it is both an activator and an antidote.

P-450 is also fragile. It took the biochemists 2 years just to learn how to stabilize and extract the red protein; "It was like breaking a light bulb to study light," Coon said. "When you break up liver membranes



**Miss Joanne Heidema, Dr. Anne Autor, Dr. Minor J. Coon, and Dr. Henry Strobel (left to right)**

you risk losing the very chemical reactions you hope to study."

Coon feels that biochemists and physicians will soon have "a more rational basis for chemotherapy." They may now be able to measure and study a patient's tolerance to powerful medications and risky chemicals during the course of treatment. "It may take years of technical refinement, but in time we should be able to do a liver biopsy, extract P-450, analyze it, and advise physicians what chemicals, singly or in combination, the patient can tolerate," he said.

In the liver P-450 oxidizes and makes soluble noxious substances that are increasingly polluting the environment. P-450 also makes it possible for the kidneys to excrete the altered potentially poisonous pollutants.

The scientist believes that the liver is the site and P-450

is the secret to part of the solution to pollution. He suggests that a possible but very difficult challenge now is to make a synthetic substitute of low molecular weight for natural P-450 so that it can be absorbed by the liver and thereby increase its efficiency. He cited as one cause for urgency the mounting presence of carbon monoxide, because it is one noxious chemical that inactivates P-450 in the liver just as it does another red protein, hemoglobin, in the blood.

Yet, according to Coon, basic work in laboratories around the world is beginning to pay off. In France, for example, scientists are growing yeasts that can decompose and break up hydrocarbon fuels, and they are actually feeding this yeast as a synthetic foodstuff to animals. The presence of P-450 in this yeast was discovered by Dr. Jean-Michel Lebeault and Dr. Eglis Lode in Dr. Coon's laboratory.

### **Heart Pacemakers' Sensitivity to Electromagnetic Radiation**

A committee of the Society of Automotive Engineers has begun laboratory studies of the sensitivity of heart pacemakers to electromagnetic radiation interference, according to Dr. Charles C. Edwards, Commissioner, Food and Drug Administration.

Edwards said that studies of the electronic devices, which sustain near-normal heartbeats and often sustain life in an estimated 50,000 Americans, are being conducted as a public service by members of the society's Electromagnetic Compatibility Committee.

The committee is working under an informal agreement with the Food and Drug Administration's Bureau of Radiological Health and has arranged for the use of industrial laboratories without cost to the Government. Manufacturers have furnished the Bureau with pacemakers for the research.

Interference sensitivities of pacemakers will be examined in terms of performance characteristics over a wide range of radiation frequencies. Information obtained will be used by the investigators in developing low-cost test procedures which manufacturers may employ in designing interference-proof pacemakers.

Electromagnetic radiation interference has been associated with one of two types of pacemakers—the widely used demand or synchronous type that acts only in instances of heart malfunction. Interference with this type of pacemaker has been caused by radiation from a variety of equipment, including medical diathermy and electrocautery units, radio transmitters, radar scanners, gasoline engine ignition systems, electric shavers and food mixers, television receivers, and microwave ovens.

Existence of the interference problem with the demand type pacemaker has been known for some years, but the problem gained national recognition in May 1970 with publication of a letter in the Journal of the American Medical Association which reported a case in which a patient wearing a pacemaker experienced irregular heart beat in the presence of microwave oven radiation.

The Food and Drug Administration, the Bureau of Radio-

logical Health, and such organizations as the Association for the Advancement of Medical Instrumentation worked through the latter half of 1970 to alert members of the health professions and heart patients to the pacemaker problem. Among other actions, letters detailing the problem and methods for meeting it were mailed to approximately 8,000 hospital administrators and about 3,500 members of the American Congress of Rehabilitative Medicine and the American Academy of Physical Medicine and Rehabilitation. Pacemaker wearers were advised on interference avoidance by their physicians.

Meanwhile, manufacturers began to design pacemakers which would not be subject to electromagnetic radiation interference. Several manufacturers in recent weeks have informed the Bureau that they have introduced pacemakers incorporating interference-prevention construction.

Information about pacemakers and action taken on the interference problem is contained in the Bureau of Radiological Health's publication, "Electromagnetic Radiation Interference with Cardiac Pacemakers," available at 45 cents a copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

### **Trauma Victims Spared By Computer Methods**

About 70 victims of severe injury have been saved from possible death from trauma, or shock, at Albany Medical Center because a team of physicians, college engineering pro-

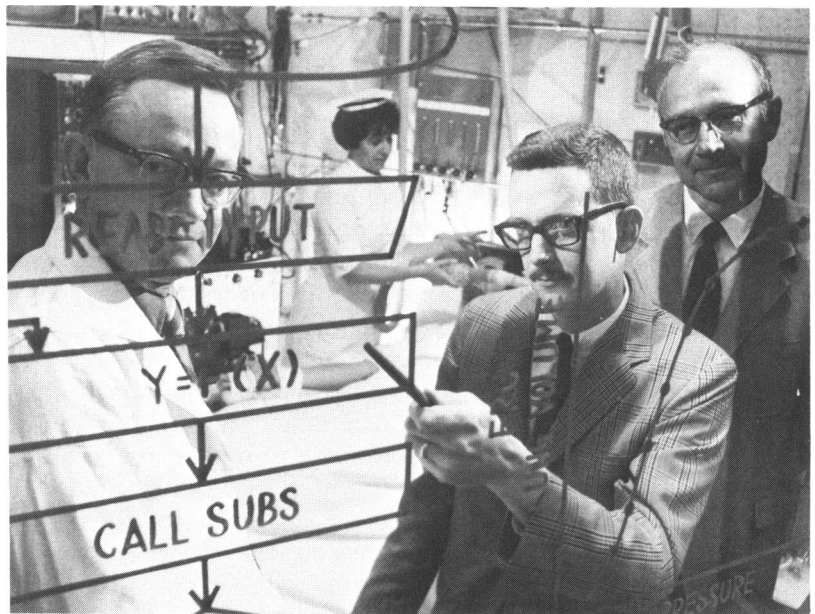
fessors, and computer scientists has found a way to predict and prevent respiratory failure.

The method combines electronic detection, high-speed computer analysis, and timely medical care to prevent patients from sinking into the irreversible post-traumatic pulmonary distress syndrome or shock lung that usually causes death within 2 to 15 days after injury.

Patients, 14 to 80 years old, have been treated in a specially-equipped "trauma research room" at the medical center. The injuries from accidents involved severed limbs, internal lacerations, and head wounds.

Electronic equipment in the one-bed trauma room is used to make periodic checks of vital processes such as heart-beat, blood pressure, and lung capacity. The equipment was developed by biomedical engineering professors at nearby Rensselaer Polytechnic Institute (RPI) at Troy, N.Y. This information is then relayed to a time-sharing computer at the General Electric Research and Development Center in Schenectady, N.Y. It is first stored in memory, then processed and analyzed, and the results returned to the bedside physician within minutes. The physician is thus alerted to the symptoms of impending disaster in time to take preventive measures to save the patient's life. Treatment includes intravenous fluids and artificial ventilation of the lungs.

Shock is a general depression of body functions marked by labored breathing, loss of fluids, erratic heartbeat, falling blood pressure, and loss of oxygen in the bloodstream. It is



Computer scientist Dr. Leonidas J. Jones (center) checks computer flow with Dr. Samuel R. Powers (left), a surgeon, and Dr. Edward J. Smith, a biomedical engineering professor

the leading killer of Americans between the ages of 3 and 37, and usually results from critical injuries caused in traffic accidents, burns, falls, gunshots, and stabbings.

According to Dr. Samuel R. Powers, professor of surgery at Albany Medical College and attending surgeon at the medical center, "the combination of measurements, computer analysis, and timely medical attention has led to virtual elimination of death from the post-traumatic form of the pulmonary distress syndrome." Very little was known about this syndrome or the methods of treatment when the project began 3½ years ago.

Powers conceived the joint program and brought together the medical, university, and industry team to do the job. He estimates that about 100 severely injured patients have been treated in the trauma research room with a majority surviving.

Trauma has become a massive public health problem for the United States. It causes the greatest loss in productive man-years of any disease, at an estimated cost of \$23 million annually. Yet, fewer than 1 percent of the nation's 7,000 hospitals are presently equipped to treat trauma around the clock.

Dr. Arthur M. Bueche, GE vice president for research and development, said, "a broad and determined effort is needed to reduce this tremendous wasteful loss. The Albany project is an excellent example of how advanced engineering and computer technology can be combined with imaginative medical practice to provide better care for the trauma victim."

The Albany Medical Center was a pioneer in trauma research. Nine projects are currently underway under the sponsorship of the National Institute of General Medical Sciences. The Albany project is



funded at approximately \$150,000 annually by the National Institutes of Health.

Although tremendous progress has been made in trauma research, several problems remain. For example, data collection and analysis were done on a time-sharing computer at the GE Research and Development Center, but a special analog-to-digital converter was required. Most commercial time-sharing computers do not have this feature.

Equipment in the research room includes a variety of physiologic transducers for measuring different body functions, signal-conditioning electronics and data phones for transmitting signals to the computer, a mass spectrometer for gas and blood analysis, oscilloscopes for displaying transducer signals, tape recorders, television screens for viewing computer information, and teletype units

for talking to the computer.

Multiple measurements recorded by the equipment are difficult for the attending physician to interpret. However, when they are assimilated and analyzed by the computer, the measurements trace the patient's fight against shock lung.

Neither the equipment nor the computer programs were available when the project originated. They were designed or modified to fit the need through the joint efforts of the medical center staff, the RPI faculty, and GE scientists.

Powers estimates that more than 20 technical papers have been published on various elements of the project. "In addition to saving lives," he said, "we also are gaining new knowledge about the bodily processes associated with injury and are making that knowledge available to the entire medical profession."

**Dr. Powers demonstrates one of the preventive measures—artificial ventilation of the lungs. Photos from the General Electric Research and Development Center**



## **International Directory of Genetic Services**

Laboratory and counseling services dealing with inherited disorders have increased by 73 percent in less than 4 years, according to the third edition of the International Directory of Genetic Services published by the National Foundation-March of Dimes.

Recent dramatic advances in diagnosis of genetic disorders before birth are reflected in new sections on amniocentesis and analysis of fluid surrounding the unborn baby.

The new publication, the most complete compilation of its kind in the world, identifies medical centers in the United States and abroad that perform amniocentesis as well as those offering sophisticated analyses of specific genetic conditions.

A total of 680 genetic service units are listed. In the United States alone, the number has soared from 156 in the first edition of the directory, published in May 1968, to 269 today.

Compiled by Dr. Henry T. Lynch, chairman, department of preventive medicine and public health, Creighton University School of Medicine, Omaha, Nebr., the directory provides a guide to the vast amount of data needed to solve genetic problems.

A researcher who wishes to determine the geographic distribution of a particular inherited condition can contact geneticists in the appropriate regions. A physician who needs to know if a particular trait has recurred in a patient's family can seek a colleague's help in gathering genetic information on relatives almost anywhere in the world.

Physicians and others in the health field can obtain a copy of the International Directory of Genetic Services without charge from the Professional Education Department, The National Foundation-March of Dimes, P.O. Box 2000, White Plains, N.Y. 10602.

Individual persons or families who wish to know where genetic counseling is available in the United States and Canada will be sent a list of counseling services, also free, upon request to the Medical Department, the National Foundation-March of Dimes at the same address.

### **Impact of Mental Illness On Families**

The impact on families which suffered a member's mental illness years ago and families in which a spouse is presently ill will be studied by a scientist who pioneered in the first systematic research of this kind, according to the National Institute of Mental Health, Health Services and Mental Health Administration.

A grant of \$42,881 has been awarded to Dr. John A. Clausen, professor of sociology, University of California at Berkeley, to initiate a 4-year project which will follow up and extend his earlier work.

Three groups of families in which either the husband or wife has been hospitalized for a serious mental illness will be studied. One group consists of 55 families—from the Washington, D.C., area—in which the husband or wife was hospitalized for mental illness some 10 to 15 years ago. At that time, these families were studied intensively by Clausen while he was chief of the NIMH Labora-

tory of Socio-Environmental Studies. The data he collected and published then have remained a landmark in the field.

He now proposes a followup and reevaluation of the same families, to learn how many of them are still intact, how well the former mental patients have adjusted, and how the family adapted over the long run to the mental illness.

In a second study involving other families, Clausen plans to interview a group in Washington, D.C., and another in the San Francisco Bay area. The families on the west coast include some which figured in previous studies employing Clausen's techniques.

The researcher believes that by studying the new patients and the impact of their illness on their families he will be able to assess what changes, if any, have taken place in the past several years in light of the modernization and wider availability of community mental health services. He hopes to determine how these changes have influenced the process of identifying mental illness and family adaptation to it.

One change he has observed is that persons hospitalized now are more severely ill than were patients hospitalized prior to the 1950's when drugs were introduced for the treatment of mental illness. His new studies will include some patients who are hospitalized and some who are receiving outpatient treatment, who years ago might have been hospitalized for a comparable illness.

Among the clues to family adjustment cited by Clausen are how husbands and wives respond to early symptoms of illness in a spouse, how fami-

lies attempt to deal with the problems caused by the disorder, how inter-family communication and relationships are altered, and how role relationships are subsequently managed.

### **Critical Injury Index Used in Illinois**

A new system designed to save accident victims' lives has been initiated by the Illinois Department of Public Health. The "Critical Injury Index," developed by the department's division of emergency medical services, medical associations, and physicians throughout the State and nation, combines a list of 10 key anatomical systems with two lists of observable conditions (see box).

Through radio connections with a nearby hospital or trauma center, a person at the scene of an accident uses the cross-reference index to describe the victim's symptoms to a physician; he does not make a diagnosis.

**Illinois State policemen administer first aid at accident scenes**





## Cigarettes and Cocktails Not Good Together

What does the combination of nicotine and alcohol do to the human body? Most studies of the effects of drugs on the body are limited to a single drug, without consideration of the context in which the drugs enter the body. If each of two drugs affect the body in particular ways, what is their effect when they enter the body almost simultaneously?

Dr. Henry Murphree, Rutgers University Center of Alcohol Studies, sought the answer to this question by conducting a project in which he controlled the drug intake and measured the performance of 16 volunteers while drinking and smoking.

Murphree provided each volunteer with enough of a mixture of vodka and orange juice to raise his blood alcohol content to about 0.07 percent. (A person with 0.15 percent blood alcohol is legally drunk; a person with 0.10 percent is legally impaired.) He then tested the subjects for their ability to concentrate, to duplicate geometric figures or symbols, and to see and react to a stimulus under the conditions of not smoking, smoking cigarettes with a low nicotine content, and smoking cigarettes with a high nicotine content.

Between the two commercial brands of cigarettes used, the difference in nicotine levels was eightfold. The low-nicotine cigarettes contained 0.2 milligram of nicotine, and the high-nicotine cigarette contained 1.6 milligrams.

The first task the subjects were given was to duplicate geometric symbols 15 seconds

The index was designed to alleviate police and others administering first aid from the responsibility of making major medical decisions. According to Dr. David Boyd, chief of the division, few law enforcement officers are qualified to make medical diagnoses; however, they are expected to or required to give a certain amount of medical assistance.

For example, the State troopers' first duty on arriving at the scene of an accident is to provide first aid. They are qualified to administer Red Cross first aid. Most personnel receive additional training in medical self-help and cardiopulmonary resuscitation.

By using the standard index, medical personnel throughout the State will be able to understand what a person observes at the accident scene. A physician then may make initial diagnosis, determine whether the person is critically injured, and direct the necessary emergency action.

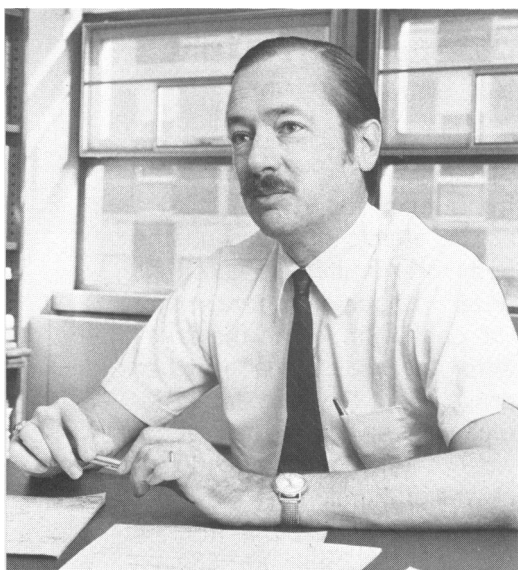
If the injury is extremely serious, the victim is taken to a trauma center; if less serious, to a nearby hospital. With the aid of the index, the physician can direct the victim immediately to the appropriate medical facility, which sometimes may not be the nearest one, and thereby he may save the victim's life.

### Critical Injury Index

<i>System</i>	<i>Abnormal</i>	<i>Severely abnormal</i>
1. Airway	obstructed, partially by foreign object or injury	complete obstruction
2. Breathing	shallow or undetectable	uneven or labored
3. Mental state	intoxicated, excited	stuporous, comatose
4. Wounds	minor, superficial	major, deep
5. Fractures	closed, deformed	open, bone exposed
6. Bleeding	minor, superficial wounds	major, deep wounds
7. Respiration	24-36 per minute	below 16 or above 40 per minute
8. Pulse	90-110 per minute	irregular or none, below 60 or above 120
9. Extremity, tingling sensation		loss of feeling (anesthetic)
10. Extremity, movement weakness		loss of functions (paralyzed)

The observer should identify the most severe category in each class and report in the order shown (that is, airway—obstructed with vomit, breathing—uneven, mental state—stuporous, and so on); identify bleeding location and state whether bleeding is serious or not serious and controllable; identify fracture sites and report amputation or near amputation.





**Dr. Murphree**

after they saw them. Next, they had to try keeping a pointer on a spot on a slowly moving turntable for 2 minutes; each person was given three chances to do this.

The results revealed a marked decrease in ability to perform tests when shifting from a low-nicotine to a high-nicotine cigarette. Shifting from a high-nicotine cigarette to not smoking produced a gain in test performance. Shifting from no smoking to a high-nicotine cigarette markedly and adversely affected test performance.

Shifting from a low-nicotine cigarette to no smoking as well as from no smoking to a low-nicotine cigarette produced a nonsignificant change in performance.

Before the study, Murphree had assumed that he would find that nicotine improved the performance of an impaired person. But the results did not confirm this. Instead, nicotine accentuated the detrimental effect of alcohol on coordination.

Another interesting finding from this study was the persistence of the effect of a high-nicotine cigarette in the body. After smoking one of these, several subjects were tested immediately and again after a half-hour rest. The half-hour was not long enough to allow the nicotine effect to dissipate, and test performance continued to be adversely affected despite the rest period.

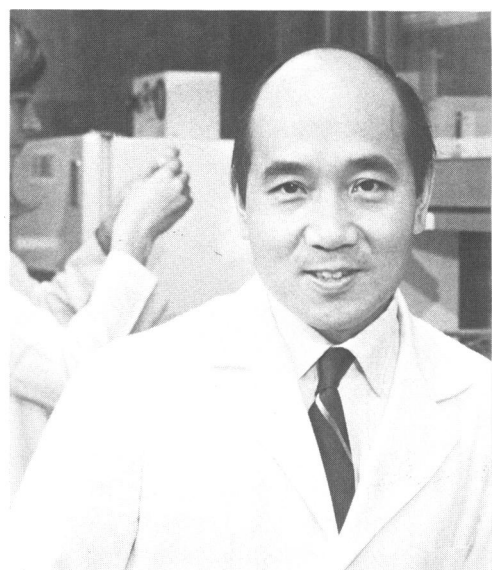
### **Thymus Transplants Are Successful**

The third and fourth successful thymus transplants in medical history have been completed at the University of Wisconsin Hospitals and the Madison General Hospital.

Instead of the normal localized reaction which follows vaccination in normal persons, people with a deficient thymus develop a progressive, uncontrolled, and often fatal infection which spreads throughout the body. Prior to the development of the thymus transplant, there was no generally applicable treatment for thymus-deficient persons.

The more successful of the two Wisconsin thymus transplants was done in spring 1971 on a 17-year-old Milwaukee boy suffering from severe pneumonia. The second, performed earlier in 1971, was instrumental in overcoming a vaccinia infection in a 2-year-old Baraboo girl.

Because of defective thymus glands, both patients had been unable to fight off their infections before their transplants. This was the first time, said Dr. Richard Hong, University of Wisconsin-Madison, that these two diseases have been treated with thymus transplants.



**Dr. Hong**

A simple new technique was used in both operations which should make possible the widespread use of thymus transplants in certain patients.

The Wisconsin technique involves injecting thymus tissue from a 12- to 20-week-old fetus into the patient's thigh muscle. A coarse-gauge needle is used to make the injection, and only a local anesthetic is required. Previous thymus transplants involved a more complicated operation where the thymus tissue was inserted into an abdominal incision.

The relative ease with which this transplant can now be performed makes it possible to repeat the transplant until it is successful and the patient can fight off infection, according to Hong. "If the operation is a success, the thymus will be rejected later, but the injected thymus fragments will have survived long enough to do their job. The fragments 'teach' the patient's bone marrow cells how to fight certain common childhood diseases. Since the patient's 'instructed' bone mar-

row cells have a long lifespan, they will protect the individual for 10 or more years. Eventually the immunity may decline but another thymus transplant can be done to restore immunity."

The National Institutes of Health and National Tuberculosis and Respiratory Disease Association funded the research of the Wisconsin team which has led to a better understanding of the role of the thymus and to the development of transplantation techniques.

In addition to Hong, the thymus team includes researchers Arthur Ammann, Shih-Wen-Huang, and Robert Levy, all postdoctoral fellows; and surgeons Gordon Davenport and John Hamacher of the University of Wisconsin and Madison General Hospitals.

"The ease of thymus transplantation should open the door to the use of thymic tissue for treating many other diseases in the future," Hong predicted. "Current research is suggesting exciting possibilities for the future. We know, for example, that the thymus is slowly worn away in many human chronic diseases and in some malignancies. We also know, from experiments with mice, that emergence of hereditary anemia and kidney disease can be prevented by thymus injection."

These experiments with chronic diseases of people and animals, as well as additional experiments with animal tumors, suggest that thymus therapy might possibly be used to strengthen a person's immune system and thus prevent or treat other kinds of diseases.

"The role of thymic therapy is just beginning to be ex-

plored," said Hong. "We are now learning how to handle different types of cells and understanding the diseases in which they should be used." Whereas most replacement therapy has been limited to liquid substances which can be isolated from human or animal tissue or artificially synthesized, scientists are now entering an era in which whole living cells can be used. These will grow and multiply after transplantation to provide not only more complete, but longer lasting replacements.

### **Cognitive Psychology**

In his introduction to the Cognitive Psychology issue of the British Medical Bulletin, September 1971 (vol. 27, No. 3), Dr. D. E. Broadbent traces this branch of psychology's tangled development during the past decade, weaving together the various strands of thought into a clear and connected pattern of present-day thinking.

Broadbent is director of the applied psychology unit, Medical Research Council, Cambridge. He warns that readers should beware of regarding cognitive psychologists as a "school" opposed or antagonistic to other experimental psychologists. And he observes: "Psychology has now reached the point, however, when it can usefully tackle many problems nearer to ordinary human concerns than were the problems of traditional psychophysics of conditioning."

The issue, which contains 16 papers, will be of interest to experimental, educational, developmental, and industrial psychologists; psychophysiologists; psycholinguists; and neurologists working on the effects of

brain lesions on learning performance as well as those interested in machine intelligence or man-computer interactive systems.

A copy of this issue can be obtained for \$6.50 from the British Medical Bulletin, British Council, 97 & 99 Park Street, London W1Y 4HQ.

### **Does "Silent Speech" Accompany Dreams?**

A project that could lead to the development of a new measure of central nervous system activity during sleep has been announced by the National Institute of Mental Health, Health Services and Mental Health Administration.

Scientists at the University of Texas in Austin are monitoring the activity of the tongue and laryngeal muscles during sleep to determine if "silent speech"—known scientifically as subvocal motor activity—accompanies dreams. If it is found that silent speech does occur, the phenomenon could be used as a measure of dream content and sleep talking.

Dr. Peter F. MacNeilage, director of the university's linguistics laboratory, says that if silent speech is found to occur "it may be a useful manifestation of dream content."

Since rapid eye movement was found to accompany most dreams, it has been used widely as an overt measure of sleep and dream activity. Its use has aided sleep research immeasurably.

The proposed method is to make recordings during sleep from representative points in the laryngeal and upper articulatory musculature to determine the frequency and patterning of subvocal muscle activity.

College student volunteers will be selected on the basis of a sleep questionnaire which includes questions about dream recall and sleep talking.

The first year of the project will be supported by a \$23,212 grant from NIMH.

### **Regional Cancer Program**

Eighteen hospitals have joined in a pioneer program to provide special attention to thousands of new cancer patients a year in Massachusetts, New Hampshire, and Maine.

An application has been approved by the Tri-State Regional Medical Program, and

nearly \$1 million in funding is pending. Tri-State is a private corporation which is supported by the Department of Health, Education, and Welfare.

The program is one of the first comprehensive regional cancer efforts in the nation. It will have 25 member institutions cooperating in the diagnosis and treatment of patients, sharing in facilities, and receiving continuing education. The members will represent 7,000 cancer patients.

Sixteen of the 25 member institutions are community hospitals in the three States. Three of the members are Federal—

Public Health Service, Brighton Mass.; Veterans Administration, Boston; and the Chelsea (Mass.) Naval Hospital. Three are chronic disease institutions—Jewish Memorial, Roxbury, Mass.; Youville, Cambridge, Mass.; and Pondville Cancer, Norfolk, Mass.; one is municipal, Boston City Hospital; one is for specialist teaching, Boston Hospital for Women; and the remaining institution is a medical center, University Hospital, Boston.

Dr. Peter J. Mozden, chief of the oncology section at Boston University Medical Center, is director of the program.

**Dr. Peter J. Mozden chats with patient**



### **Adverse Reactions to Drugs**

To detect and determine “at the earliest possible moment” adverse drug reactions not discovered by studies in laboratory animals or by early clinical investigations, a national center for drug surveillance is needed. Such a center would increase the safety of drugs and

facilitate early availability of new important drugs, according to a report of the Drug Research Board of the National Research Council.

While beneficial effects of drugs have been increasingly documented, present mechanisms for detecting and identifying adverse reactions

are "haphazard and inadequate," the report states. More investigations are needed on specific reactions to drugs and chemicals; interactions between different drugs, between drugs and foods, and between drugs and alcohol; and long-term effects of drugs such as oral contraceptives, antidiabetics, anticoagulants, and cholesterol-lowering agents.

The recommendations and the proposal for the national center were made at the 1970 International Conference on Adverse Reactions Reporting Systems. The conferees recommended that the center be staffed by highly trained scientists in medicine, epidemiology, pharmacology, statistics, computer sciences, and other disciplines. In addition to its other activities, the center should address itself to the following programs:

**Intensive surveillance.** Strict monitoring programs should be pursued on the effects of drugs on hospital patients and on outpatients to detect previously unsuspected reactions; to relate drug effects to such characteristics as age, sex, disease, and genetic traits; and to determine patterns of drug use and misuse.

**Collection of spontaneous reports of reactions.** Voluntary reports of adverse drug reactions, mainly by physicians, were the first and until recently almost the only source of knowledge, the report states. These spontaneous observations reported to medical journals, drug manufacturers, research groups, medical associations, and other agencies have not

proved effective in the United States. The report points out that many alerting observations have appeared in journals in England and other countries long before suspicions were formally reported in the United States. The conferees recommended that the national center should be the focal point for receiving all voluntary and solicited reports and should investigate them further.

**Studies on long-term drug effects.** The center should generate epidemiologic research, particularly on drugs used increasingly on a long-term basis for treatment or prevention of diseases and of unwanted but normal physiological phenomena such as pregnancy.

**Vital statistics surveillance.** Programs should be developed to survey causes of death in order to determine any excess incidence of specific diseases.

**Information dissemination.** The center should disseminate information in a single reference volume that is often updated and in periodic drug surveillance reports.

**Pharmacology staff.** A staff of pharmacologists and analytic chemists should facilitate integration of center programs and develop laboratory information to supplement clinical reports.

A limited number of copies of the "Report of the International Conference on Adverse Reactions Reporting Systems" is available from the Drug Research Board, National Research Council, 2101 Constitution Avenue, NW., Washington, D.C. 20418.

## Contracts for Research on Heart Attack Deaths

Twelve new contracts totaling \$1,002,786 have been awarded in support of research on the onset of acute heart attacks and sudden cardiac death by the Myocardial Infarction Program of the National Heart and Lung Institute, National Institutes of Health.

The following are the principal investigators, their institutions, the amount awarded for the first year of operation, and a brief description of each project.

**Dr. H. D. McIntosh**, Baylor College of Medicine, the Methodist Hospital, Houston (\$137,594), will study abnormalities in heart rhythm developing during various phases of sleep in heart-attack patients. EEG, EKG, electro-oculogram, and related data will be recorded during sleep in patients undergoing the acute and

recovery stages of acute heart attacks and in patients whose heart damage has healed. Of particular interest are arrhythmias occurring during the rapid-eye-movement phase of sleep.

**Dr. S. H. Rahimtoola and Dr. K. Rosen**, Cook County Hospital, Chicago (\$72,844), will conduct extensive electrophysiological studies in patients with disease-induced injury to elements of the specialized conduction system, which originates and transmits to all parts of the heart's pumping chambers the electrical impulses that trigger heartbeat. The propagation of the electrical impulse by this system, which consists of three major bundles of fibers (fascicles), is essential to maintain adequate heart rate and pumping ability. In some patients, two of these bundles may be disrupted

(bifascicular block) without compromising heart rate or output. However, damage to the third and last "link" in the conduction system can precipitate complete heart block, which drastically slows heart rate and may result in unconsciousness, convulsions, or sudden death. They will study the natural history of bifascicular block and effectiveness of preventive measures, such as artificial pacemakers.

**Dr. G. M. Friedman**, medical research department, Kaiser Foundation Research Institute, San Francisco (\$89,900), will study the extensive data bank of medical, physiological, and biochemical information on employees enrolled in the Kaiser Permanente Health Plan in an attempt to identify antecedents of acute heart attacks or sudden cardiac death.

**Dr. H. J. Levine**, New England Medical Center Hospitals, Boston (\$58,530), will study the effects on heart rhythmicity and pumping performance of improving the oxygen supply to those segments of the heart muscle in which blood supply has been compromised by acute heart attacks. Paradoxically, whereas improving the blood and oxygen supply to the infarcted area reduces the extent of permanent heart damage resulting from the attack, the period of recovery from blood deprivation is associated with heightened risk of serious heart arrhythmias that are often the precipitating event in sudden cardiac death.

**Dr. D. C. Harrison**, Stanford University Medical Center, Stanford, Calif. (\$80,991), will perform extensive cardiovascular studies—including the collection, analysis, and integration of electrophysical, hematologic, and biochemical data—in patients threatened by impending heart attacks in order to define specific factors that may precipitate the acute episode and to seek means of averting it.

**Dr. H. T. Dodge**, University of Washington, Seattle (\$252,638), will carry out the following subprojects: (a) analysis of extensive early physiological data obtained in heart-attack cases by the Seattle mobile coronary care system, (b) in-depth studies of victims of ventricular fibrillation who were successfully resuscitated by this rescue system, and (c) studies to assess the predictive value of stress electrocardiograms and coronary angiograms in identifying subjects at high risk of acute heart attacks or sudden cardiac death, or both.

**Dr. G. C. Oliver and Dr. J. R. Cox, Jr.**, Washington University School of Medicine, St. Louis (\$235,671), will study premature ventricular contractions as a risk factor in sudden cardiac death, employing a computerized arrhythmia-recognition system capable of analyzing continuous, long-term electrocardiographic recordings in high-risk persons.

**Dr. L. S. Cohen**, Yale University Medical School, New Haven (\$13,800), will assess the effectiveness of intramuscular injections of lidocaine (an antiarrhythmic agent as well as a local anesthetic) in preventing premature ventricular contractions and other potentially serious arrhythmias in heart-attack patients. Speed of action, duration of action, side effects, and other pharmacological aspects of lidocaine will also be studied.

**Dr. J. S. Kastor**, University of Pennsylvania, Philadelphia (\$15,318), will evaluate the effectiveness of varying doses of intramuscular atropine in correcting the abnormally slow heart rate (bradycardia) that often develops in the wake of an acute heart attack. In its cardiovascular applications, the primary action of atropine is to speed up the heart by blocking the vagus nerve, which normally acts as a brake on the heart rate.

**Dr. C. T. Lambrew**, Meadowbrook Research and Education Facility, East Meadow, N.Y. (\$9,000), will evaluate the effectiveness of intramuscular lidocaine or atropine in preventing potentially lethal arrhythmias in patients with symptoms strongly indicative of acute heart attack when first seen by ambulance personnel.

**Dr. S. J. Sarnoff**, Survival Technology, Bethesda, Md. (\$26,500), will assist in coordinating the Yale, Pennsylvania, and Meadowbrook studies concerned with developing more effective prophylactic therapy against sudden cardiac death through the use of drugs influencing heart rate or rhythm.

**Dr. Barton J. Gershen**, Montgomery County Heart Association, Bethesda, Md. (\$30,000), in direct collaboration with the NHLI Cardiology Branch, will evaluate the effectiveness of injected lidocaine or atropine in preventing the progression of minor disturbances of heart rhythm into catastrophic arrhythmias in patients suspected of suffering acute heart attacks when first seen by the special Heart-mobile ambulance.



## Birth Control Method Tried "After-the-Fact"

An "after-the-fact" new method of birth control is being tested at Chapel Hill, N.C. If it is successful, a sigh of relief will go up from millions who find the estrogen pill too dangerous and contraceptive devices such as the intrauterine device (IUD), the diaphragm, and the condom too inconvenient, uncomfortable, or ineffective.

The first clinical research in the United States using chemicals called "prostaglandins" as menstrual regulators is beginning at the University of North Carolina at Chapel Hill. Physicians there hope that their research will lead to a safe birth control pill which is used only once a month.

Ten women have volunteered to use prostaglandins for birth control in the first clinical trials. Surgical abortion will be available to any in whom the drugs are ineffective.

Clinical trials will then be expanded to about 100 and then to 1,000 women. The health of these women will be watched closely and their bodies monitored for physiological changes during administration of the drugs and for a prolonged period afterward.

Prostaglandins act by causing the uterus to contract. This brings on menstruation which expels the ovum, whether it has been fertilized or not.

Prostaglandins occur naturally in semen and in certain female tissues. Their role, if any, in human reproduction is unknown. The process through which prostaglandins initiate menstruation is also unknown. These mechanisms will be studied in the research.

Research into prostaglandins has a long but uneven history. In 1930 it was discovered that semen causes the uterus to contract. The active ingredients in semen which cause this contraction were isolated and identified as prostaglandins. No use was known for the new-found chemicals for 40 years. Then in 1969, an event was reported which led to the present University of North Carolina research. Dr. S. Bergstrom and his co-workers at the Karolinska Hospital in Stockholm, Sweden, had used prostaglandins to induce abortion. In August 1970, a research team at the university, headed by Dr. Charles Hendricks, chairman, department of obstetrics and gynecology at the university's Memorial Hospital

began using prostaglandins as abortifacients.

Administered into the vagina, the uterus, or directly into the bloodstream, prostaglandins have brought on abortion in 46 women who were 6 to 20 weeks pregnant during 1971.

According to Dr. William Brenner, a member of the research team, none of these women sustained injury: "Serious complications observed in surgical abortions have not been observed with prostaglandins."

Besides being effective abortifacients, prostaglandins were found to bring on menstruation prior to implantation of the egg. Implantation of the fertilized egg in the uterine wall normally occurs about 6 weeks after intercourse.

Research into the use of prostaglandins as menstrual regulators was begun while they were being used for abortions. Researchers reasoned that if menstruation could be brought on regularly at the end of each monthly cycle, unwanted pregnancies would be averted.

Prostaglandins have been used successfully as menstrual regulators in research on three species of animals, including monkeys. In the clinical research with women, two varieties of naturally occurring prostaglandins will be administered into the vagina.

Synthetic varieties of prostaglandin, however, may prove more valuable than natural ones. It is hoped that synthetic prostaglandins will be developed which can be given orally, in pill form, and which will have fewer side effects than those being used now.

When prostaglandins have been used to induce abortion, patients have had nausea and pelvic pain. Physicians at the university hope to lessen these side effects by experimenting with different "routes and rates of administration" and to demonstrate that prostaglandins are superior to the daily estrogen pill and other birth control methods.

Dr. Frederick Kroncke, another researcher in the project, pointed out that there are areas of the world where people are interested in birth control but do not have the money nor the medical counsel necessary for the presently used contraceptives. In these areas prostaglandins may prove to be the cheapest and most effective means of birth control.

Until recently, most of the funds for the prostaglandin research have come directly

from the University of North Carolina Department of Obstetrics and Gynecology with some assistance from the Upjohn Company, which supplies prostaglandins to the investigators.

Since mid-July 1971, money has also been received from a grant from the Agency for International Development to the North Carolina Population Center.

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## Program Notes

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### Shelter for Homeless Alcoholics

The East End Hotel, a shelter for homeless alcoholics in Baltimore, Md., is demonstrating that "meeting the social, nutritional, and medical needs of such alcoholics with an appropriate residential program reduces their compulsion to drink and motivates some as yet unknown percentage to sobriety and productive citizenship."

For homeless alcoholics "unlikely to recover," Maryland's Intoxication and Alcoholism Control Law of 1968 states that "supportive services and residential facilities shall be provided so that they may survive in a decent manner." The Baltimore facility was the first such shelter in the State. Two others have subsequently been established, in Cecil and Harford counties.—**Maryland's Health**, No. 3, 1971.

### Continuing Care Regulations

Rules and regulations in the area of continuing care that affect all hospitals in Massachusetts have been adopted by the Massachusetts Public Health Council. Continuity of care requires consideration of both the short-term and long-term needs of the patient. His medical and nursing requirements must be related to the social needs that affect his recovery.

The regulations adopted in Massachusetts are designed to provide for continuity of care by meeting patients' needs at the various stages of care, facilitate the transfer of each patient from the hospital to his home or another facility, assist the hospital staff in recognizing and providing for the post-hospital needs of patients, contribute to the optimum use of hospital beds, and most important, assist the patient to resume as healthy and productive a role as possible.—**This Week in Public Health** (Massachusetts Department of Public Health), Aug. 30, 1971.

### One-Man War on Litter

To get Oregonians to take an active interest in the State's highway litter problem, a 20-year-old youth from Eugene offered to donate a pint of blood whenever anyone collected a truckload of litter from Oregon highways. Patrick Mooney stipulated that persons doing so could arrange to have blood from him donated to a patient or hospital of their own choosing.—**Keep America Beautiful, Inc.**

### Volunteer Blood Donor Program

To help fund a program aimed at signing up 250,000 voluntary blood donors in the Chicago area, Governor Richard B. Ogilvie presented a \$10,000 State check to officials of the Metropolitan Chicago Blood Council.

The new program seeks pledges to donate blood, rather than actual blood contributions. Thus, medical officials can assure the availability of blood on a more regular, constant basis.

The eventual goal of the program, Ogilvie said, is to make use of commercial blood in Illinois hospitals unnecessary. Incidence of serum hepatitis is far higher among patients receiving blood from commercial donors than among those receiving it from volunteer programs.

### Physicians' Assistants

Upper middle class communities more readily accept the idea of nurses and medical assistants performing tasks usually carried out by physicians than do lower middle and working class communities. This was the conclusion Loring Conant, Jr., M.D., and associates reached after a study of the attitudes of residents of two Boston suburban communities, based on household interviews.

One proposed solution for improving the medical care of the underprivileged is greater use of nurses or medical assistants. Conant and associates pointed out that

it might be less disruptive to introduce these new personnel in upper middle class areas, making more physicians available for lower class areas.—**American Journal of Diseases of Children**, September 1971.

### Toward Recycling Junked Autos

A research project on the removal of copper, tin, and chromium from automotive scrap steel is underway at the metallurgy division of the Atomic Energy Commission's Ames Laboratory at the University of Iowa. Development of an economical method for removing these metals would increase the scrap's value and facilitate recycling of the estimated 20 million derelict auto bodies lying about in junk yards and the 7 million cars added to the country's scrap piles annually.

For the first year of the project, which is to run for 2 years, Solid Waste Research, Environmental Protection Agency, has provided a grant of \$40,000.



**F. A. Schmidt (left), staff member of Ames Laboratory, Iowa State University, holds compacted steel that will be used in an electron beam melter. O. N. Carlson (right) holds unprocessed auto scrap steel. Back of the men is a crucible from an electron beam melter, one of three kinds of melters being tested for the reclamation of scrap steel**

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*Announcements of conferences should be sent to HSMHA Health Reports at least 6 months before the date of the event.*

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